

CLAIMS

What is claimed is:

1. A fault-tolerant server comprising:

- (a) a communications link;
- (b) a first computing element in electrical communication with the communications link;
- (c) a second computing element in electrical communication with the communications link;
- (d) a first local mass storage device in electrical communication with the first computing element; and
- (e) a second local mass storage device in electrical communication with the second computing element,

wherein the first computing element and the second computing element issue substantially similar instruction streams to at least one of the first local mass storage device and the second local mass storage device.

2. The fault-tolerant server of claim 1 wherein each computing element comprises a respective Central Processing Unit (CPU) in electrical communication with a respective local input-output (I/O) subsystem.

3. The fault-tolerant server of claim 2 wherein the local I/O subsystem is in electrical communication with at least one of the first local mass storage device and the second local mass storage device.

4. The fault-tolerant server of claim 2 wherein the communications link comprises a respective switching fabric in electrical communication with the respective CPU.

5. The fault-tolerant server of claim 4 wherein the switching fabric is in electrical communication with at least one of the first local I/O subsystem and the second local I/O subsystem.
6. The fault-tolerant server of claim 5 wherein the switching fabric is in electrical communication with the other one of the first local I/O subsystem and the second local I/O subsystem.
7. The fault-tolerant server of claim 1 further comprising a delay module in electrical communication with the local I/O subsystem to delay transmission of at least one of the substantially similar instruction streams.
8. The fault-tolerant server of claim 1 wherein the communications link comprises a backplane.
9. The fault-tolerant server of claim 8 wherein the communications link further comprises a backplane link in communication with the backplane.
10. The fault-tolerant server of claim 1 wherein the first computing element and the second computing element further comprise a 1U rack-mount motherboard.
11. The fault-tolerant server of claim 1 wherein the first local mass storage device is located on a same motherboard as the first computing element.
12. The fault-tolerant server of claim 1 wherein the second local mass storage device is located on a same motherboard as the second computing element.
13. A method for accessing at least one of a first local mass storage device and a second local mass storage device in a fault-tolerant server, the method comprising the steps of:
 - (a) establishing communication between a first computing element and a first local mass storage device;

(b) establishing communication between a second computing element and a second local mass storage device; and

(c) issuing, by the first computing element and the second computing element, substantially similar instruction streams to at least one of the first local mass storage device and the second local mass storage device.

14. The method of claim 13 further comprising the step of executing the second computing element in lockstep with the first computing element.

15. The method of claim 13 wherein step (c) comprises the steps of:

(c-a) storing a datum in one of the first local mass storage device and the second local mass storage device, and

(c-b) storing the datum in the other one of the first local mass storage device and the second local mass storage device by mirroring software.

16. The method of claim 13 further comprising the step of communicating with a backplane.

17. The method of claim 13 further comprising introducing a parity bit to detect an error in the established communication.

18. The method of claim 13 further comprising the step of communicating with a 1U rack-mount motherboard.

19. The method of claim 13 further comprising the step of communicating with an input/output (I/O) subsystem over a switching fabric.

20. The method of claim 13 further comprising the step of delaying the accessing of at least one of the first local mass storage device and the second local mass storage device.

21. An apparatus for accessing at least one of a first local mass storage device and a second local mass storage device in a fault-tolerant server, the apparatus comprising:

(a) means for establishing communication between a first computing element and a first local mass storage device;

(b) means for establishing communication between a second computing element and a second local mass storage device; and

(c) means for issuing, by the first computing element and the second computing element, substantially similar instruction streams to at least one of the first local mass storage device and the second local mass storage device.